

## Functional dissociation in working memory maintenance of voice identity and location

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**Abstract** The aim of the study was to investigate working memory (WM) for the location and identity of human voices in an attempt to determine whether the neural system for auditory WM in humans, like the one for visual WM (e.g. Courtney et al. 1996; Courtney et al. 1998; Sala et al. 2003), exhibits a functional dissociation for spatial and nonspatial information. WM tasks and a control task were presented in a delayed recognition paradigm in which subjects were instructed to remember either locations or voices, or neither. During the performance of the tasks, subjects underwent T2\*-weighted interleaved gradient-echo, echo-planar imaging and the images were analyzed separately for each subject using multiple regression. The results showed that WM maintenance for voices and auditory locations activated a distributed neural network including temporal, parietal, and frontal regions but the magnitude of activation within these activated areas shows a different functional topography depending on the type of information being maintained. Activation in the dorsal frontal cortex and posterior parietal cortex was greater for location delays than for voice delays. Conversely, ventral frontal regions were more active for voice than for location delays. The

present findings indicate that, during auditory WM, maintenance of spatial or nonspatial information modulates activity in dorsal and ventral frontal cortex, respectively. These results support the idea that the frontal cortex is organized, in part, according to the type of information being maintained in WM (Wilson et al. 1993; Levy and Goldman-Rakic 2000).

### References

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